

### REMARKS

Claims 1-27 are in the application.

The Examiner has required, pursuant to 35 U.S.C. 121, applicants to elect between one of the following groups of inventions:

I. Claims 1-25, drawn to a process for producing algae resistant roofing granules, classified in class 427, subclass 212.

II. Claims 26-27, drawn to a process for producing algae resistant roofing shingles, classified in class 427, subclass 180.

The Examiner states that the inventions are distinct, each from the other because: inventions I and II are related as product and process of use. The Examiner notes that the inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). The Examiner states that in the instant case granules can be used for outdoor surfacing other than roofing.

The Examiner further states that because these inventions are distinct for the reasons given, and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

Confirming the provisional telephonic election made by applicants' attorney on August 8, 2005, applicants respectfully elect the invention of Group I, claims 1-25, for prosecution in the present application, with traverse.

The restriction requirement is not proper, and should be withdrawn for the following reasons.

In order for the subject matter of the Group I claims to be distinct from the subject matter of the Group II claims, the product as claimed by the Group I claims must be useful in a materially different process than that of the Group II claims. By this test, the two groups of claims are not distinct. The use proposed by the Examiner is not materially different than that of the Group II claims. The algae-resistant granules are presumably being used in the use proposed by the Examiner, namely, for "outdoor surfacing other than roofing," for the exactly the same purpose as they are being used in the roofing shingles of the Group II claims. Further, the use proposed by the Examiner appears speculative and does not appear to be a "substantial" use, nor does it appear to be a "specific" use. A use proposed for the determination of distinctiveness in making a restriction requirement should be no less substantial and no less specific than that required under case law in determining patentability under 35 U.S.C. § 101. As the Court of Appeals for the Federal Circuit recently explained in the Fisher case, a proposed use must be both specific and substantial. In re Fisher, 76 USPQ2d 1225, 1230 (Fed. Cir. 2005). In the present case, the Examiner has suggested that the product roofing granules could be used for surfacing some other outdoor surface. The proposed use is on its face not a specific use. Furthermore, this proposed use is not substantial. To the undersigned attorney's knowledge, there does not appear to be any genuine, actual use of *roofing* granules for anything other than roofing. The Examiner's proposed alternative use could encompass simply dumping the granules on the ground – this is not a substantial use. Consequently, applicants respectfully request reconsideration and withdrawal of the restriction requirement.

The presently claimed invention was reduced to practice prior to November 27, 2002, the earliest effective date of U.S. Patent Publication 2004/0110639, Application No. 10/717,836 ("Joedicke '639"), relied upon by the Examiner either alone or as a

primary reference taken in combination with other references, in rejecting claims 1-16 under 35 U.S.C. 103(a). Applicants respectfully traverse each such rejection, and request reconsideration and withdrawal of each reference, because Joedicke '639 is not prior art with respect to the presently claimed invention.

Joedicke '639 claims the benefit of U.S. Provisional Patent Application No. 60/429,464, filed November 27, 2002, while Joedicke '639 itself was filed on November 20, 2003. The disclosure of the provisional application does not fully support Joedicke '639's claims, as acknowledged by the statement appearing at paragraph [00001] that "[t]his application is a *continuation-in-part* of copending provisional application . . . ." (sic, emphasis added). Consequently, to the extent that the corresponding claims are not supported by the provisional application disclosure, the effective filing date of subject matter of those unsupported claims is November 20, 2003, after the filing date of the present application.

Claims 1-2 and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Joedicke '639 (US 20040110639). This rejection is respectfully traversed, and reconsideration and withdrawal of the rejection are respectfully requested.

The Examiner states that Joedicke '639 teaches that prior art algae-retardant granules comprising inner layer with a substantial loading of cuprous zinc compounds and outer coloring layer have insufficient rate of copper/zinc release due to the low porosity of the outer coating, which acts as a barrier to copper/zinc ion migration (referencing paragraph 16). The Examiner further states that Joedicke '639 teaches that the rate of copper/zinc release can be increased by incorporating an internal gas-forming compounds in the outer coloring layer, which also has cuprous/zinc compounds, by rendering the outer coating porous (referencing paragraph 19). The Examiner further states that Joedicke '639's process comprises applying to base granules a first coating

composition containing sodium silicate, a kaolin clay (aluminosilicate), (80-150) plus 25 parts (claimed more than 2 %) of a combination of cuprous oxide and zinc sulfide, and pigment (referencing the table at paragraph 29); kiln-firing the coated granules; cooling the fired coated granules (referencing paragraphs 29-34), and applying to the algaecide-bearing granules an outer coating composition containing sodium silicate, a kaolin clay, an internal gas forming compound, the cuprous zinc compounds and a pigment, and kiln-firing the colorant-coated algaecide-bearing granules at 890-910 °F (432-488 degrees C) to insolubilize the binder (referencing paragraph 38) and to form microvoids (claimed voids of less than 2 mm) in the coating layer (referencing paragraph 42). The Examiner goes on to state that the internal gas forming compounds including a member selected from the group consisting of hydrogen peroxide, alkali metal perborates, alkali metal persulfates, alkali metal borohydrides, and alkali metal azides, is present in the second or outer coating in the amount of from 0.25% w/w to about 2.5% w/w based on the dry weight of the coating composition, to render the second or outer coating porous and thereby increasing the rate of algicidal leaching (referencing paragraph 19).

The Examiner admits that Joedicke '639 fails to teach that the inner coating also includes the internal gas forming compounds. The Examiner states that it is the Examiner's position that the outer layer of Joedicke '639 having would have greater copper/zinc release rate than the inner layer since the inner layer is less porous than the outer layer, or it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant pore size (including those of claimed invention) in Joedicke '639 through routine experimentation in the absence of showing of criticality.

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated internal gas forming

compounds in both layers of algae-retardant granules of Joedicke '639 with the expectation of providing the desired increased rate of algaecide release since increased porosity of the outer layer removes the barrier to the inner layer, as taught by Joedicke '639, and obviously, the increased porosity of the inner layer would increase algaecide release within the inner layer itself.

Applicants respectfully traverse the Examiner's conclusions, and contend that, even if it were available as prior art, Joedicke '639 would not make out a *prima facie* case of obviousness with respect to the presently claimed invention.

Applicants also respectfully note that Joedicke '639 is not available as prior art with respect to the presently claimed invention.

Contrary to the Examiner's suggestion, one of ordinary skill in the art would be taught away from including pore-forming materials in an inner layer by Joedicke's use of such materials in the outer layer of his granules. Joedicke employs *slow-release* algaecidal compounds in his inner layer (paragraph 0025), and prefers to avoid the use of algaecide in the outer layer entirely (paragraph 0022). One of ordinary skill in the art would understand that making the inner layer porous would be inconsistent with the use of a slow-release algaecide. If too much algaecide is released too early, the effective life of the algae-resistant granules could be significantly reduced. Joedicke addressed the problem encountered when granules are manufactured using an outer layer including colorant pigments and an inner layer containing algaecide, namely, that the outer layer inhibited the effective release of algaecide from the inner layer. One of ordinary skill in the art would understand that making the inner layer porous as well would tend to promote the release of too much algaecide too soon, ultimately defeating Joedicke's purposes.

Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 103(a) over Joedicke '639 are respectfully requested for these reasons.

Claims 3-11 and 16-24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Joedicke '639 in view of Japanese Patent Publication 60147276 ("JP '276"). This rejection is also respectfully traversed, and reconsideration and withdrawal of the rejection are respectfully requested.

The Examiner states that Joedicke '639 is being applied in this rejection for the same reasons as in the case of the prior rejection of claims 1-2 and 25. However, the Examiner admits that Joedicke '639 fails to teach that the outer layer is applied to unfired inner layer and both layers are fired simultaneously (referencing Claim 3). The Examiner further states that JP '276 teaches that firing simultaneously two clay-containing glaze layers allows the layers to diffuse into each other and form a diffusion layer having mechanical strength (referencing the abstract).

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied the outer layer to unfired inner layer in Joedicke '639 and fire both layers simultaneously with the expectation of providing the desired diffusion layer having mechanical strength, since JP '276 teaches that firing simultaneously two clay-containing glaze layers allows the layers to diffuse into each other and form a diffusion layer having mechanical strength.

The Examiner further states that as to claim 16, Joedicke '639 teaches that the pigments include: titanium dioxide, chromium oxide, yellow iron oxide, red iron oxides, black iron oxide, chrome titanate (claimed transition metal oxides) (referencing paragraph 21).

The Examiner further states that as to pore size, thickness and concentration limitations, it is held that it is not inventive to discover the optimum or workable ranges of

results effective variables by routine experimentation, citing In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); and In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

The Examiner further concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant pore size, thickness, and concentration parameters (including those of claimed invention) in Joedicke '639 in view of JP '276 through routine experimentation in the absence of showing of criticality.

Applicants respectfully traverse the Examiner's conclusions, and note again that Joedicke '639 is not available as prior art with respect to the presently claimed invention.

Applicant contend that even if Joedicke '639 were available as prior art, Joedicke '639 would not be properly combinable with JP '276, and even if such a combination were made, the combination would not render applicants' presently claimed invention *prima facie* obvious.

JP '276 discloses a process for applying a primary anti-corrosive glaze layer to a metal plate, then applying a secondary glaze layer for good wear resistance over the first anti-corrosive glaze layer to form a porcelain undercoat, firing the undercoat, and then applying a fluororesin coating over the undercoat. Firing the two layers simultaneously provides a diffusion layer between the two coats.

Introducing porosity as in Joedicke '639 would defeat JP '276's purpose, because porosity would decrease the corrosion resistance of the undercoating. Conversely, while the Examiner asserts that the diffusion layer in JP '276 provides mechanical strength, the cause of this alleged advantage is not disclosed by JP '276, at least in the English language Derwent record for this reference provided by the Examiner. While the reference discloses a coating with improved mechanical strength,

this may be due to the addition of a second undercoating layer, the use of a fluororesin outer coating, or for some other reason. Given that Joedicke '639 discloses an outer coating with microvoids, it is not clear that firing the first and second layers at the same time would improve the mechanical strength of the coating, simply because the internal strength of the second coating layer would likely be less than that first layer or the diffusion layer therebetween. Thus, JP '276 would not provide any motivation to one of ordinary skill in the art to modify the process of Joedicke '639 as suggested by the Examiner.

In the absence of Joedicke '639, there is nothing in JP '276 to disclose or suggest the presently claimed invention to one of ordinary skill in the art. In particular, there is no teaching or suggestion that primary and second glaze layer should be porous for any reason. Further, JP '276 is itself not properly prior art with respect to the present invention because it relates to a non-analogous art – forming porcelain coatings on metal objects.

The rejection entered under 35 U.S.C. 103(a) over Joedicke '639 in view of JP '276 should be withdrawn for these reasons.

Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joedicke '639 in view of JP '276, further in view of U.S. Patent 3,507,676 ("McMahon"). This rejection is also respectfully traversed, and reconsideration and withdrawal of the rejection are respectfully requested.

The Examiner states that Joedicke '639 in view of JP '276 are being applied in the case of this rejection for the same reasons as in the case of the rejection of claims 3-11 and 16-24. The Examiner admits that Joedicke '639 in view of JP '276 fails to teach that ZnO can be used as algacide. The Examiner notes that McMahon teaches that ZnO is suitable for the use as algacide in coating of roofing granules (referencing



column 1, lines 14-15). The Examiner states that it is held that the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination, citing Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used ZnO as algacide in Joedicke '639 in view of JP '276 since McMahon teaches that ZnO is suitable for the use as algacide in coating of roofing granules.

As noted above, Joedicke '639 is not available as prior art with respect to the presently claimed invention. Further, there is nothing in JP '276, nor in McMahon, nor in the combination of the two which would render the presently claimed invention obvious to one of ordinary skill in the art. In particular, there is nothing in either JP '276 nor in McMahon which teaches or suggests the addition of a void-forming material in a process for producing algae-resistant roofing granules, such as is required by the independent claims from which the presently rejected claims depend. Consequently, the combination of JP '276 and McMahon do not make a *prima facie* case of obviousness of the presently claimed invention, and reconsideration and withdrawal of the rejection entered under 35 U.S.C. 103(a) of claims 12-13 are respectfully requested for these reasons.

Claims 14-15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Joedicke '639 in view of JP '276, further in view of U.S. Patent 4,430,108 ("Hojaji"). This rejection is respectfully traversed, and reconsideration and withdrawal of the rejection are respectfully requested.

The Examiner states that Joedicke '639 in view of JP '276 are applied in the case of this rejection for the same reasons as stated in the case of the rejection of claims 3-11 and 16-24. The Examiner admits that Joedicke '639 in view of JP '276 fails to teach that sugar is used as gas-forming material. The Examiner state nonetheless that Hojaji

teaches that sugar is suitable for the use as gas-forming material (referencing column 8, lines 47-57) in glass compositions for roof shingles (referencing column 4, lines 19-20).

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a sugar as gas-forming material in Joedicke '639 in view of JP '276 since Hojaji et al teach that sugar is suitable for the use as gas-forming material in glass compositions for roof shingles.

The Examiner's conclusion is respectfully traversed.

First, it should be noted that Joedicke '639 is not prior art with respect to the present invention and thus not available as a reference to take in combination with JP '276 and Hojaji. There is nothing in either JP '276 or Hojaji, nor in the combination thereof, that would render the presently claimed invention obvious to one of ordinary skill in the art.

JP '276 and Hojaji are not properly combinable, as they related to utterly unrelated arts. JP '276 relates to improved porcelain coatings, while Hojaji discloses a method for making foam glass that can be incorporated as a reinforcing material in products such as asphalt shingles, which are known to be conventionally reinforced with fiber, such as glass fiber. Adding sugar as a foaming agent in JP '276's anticorrosion coatings to create porosity in the coatings would destroy the utility of JP '276, since it would increase the exposure of the underlying metal panel to the environment. Further, one of ordinary skill in the art would find the glass used to form the web reinforcing and fill the asphaltic body of the shingle to be wholly unrelated to the ceramic coating applied to the granules embedded in the asphalt. Apples and oranges. Thus, the combination of JP '276 and Hojaji do not make out a *prima facie* case of obviousness.

Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 103(a) of claims 14 and 15 are respectfully requested for these reasons.

Claim 25 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,378,408 ("Joedicke '408) in view of Joedicke '639. This rejection is also respectfully traversed, and reconsideration and withdrawal of the rejection are respectfully requested.

The Examiner states that Joedicke '408 discloses all claimed limitations except for the layer having algacide material. The Examiner further states that Joedicke '639, as applied to in the rejection of claims 1-2 and 25, teaches that the addition of algacide material in a coating layer renders roofing granules algae-resistant.

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added an algacide material to a coating layer of Joedicke '408 with the expectation of providing the desired algae-resistant roofing granules, as taught by Joedicke '639.

As previously noted, Joedicke '639 is not prior art with respect to the presently claimed invention. As acknowledged by the Examiner, Joedicke '408 does not disclose the addition of an algacidal material. Consequently, Joedicke '408 cannot render the presently claimed invention obvious to one of ordinary skill in the art, and Joedicke '408 does not make out a *prima facie* case of obviousness of applicants' claim 25. Nor would the combination of Joedicke '408 with another reference disclosing algae-resistant roofing granules render the presently claimed invention obvious. Joedicke '408 is interested in forming voids in the granule coating for the purpose of light scattering, to reduce the requirement for an opacifying pigment such as titanium dioxide in the coating.

Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 103(a) of claim 25 are respectfully requested on this basis.

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Applicants respectfully solicit reconsideration, withdrawal of the rejections entered, and an early notice of allowance.

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Respectfully submitted,



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